

Max-SAT Evaluation 2014

Ninth Edition

Josep Argelich Chu Min Li
Felip Manyà Jordi Planes
Ruben Martins

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Outline

- 1 What's new this year
- 2 Results
- 3 More information

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- 1 What's new this year
 - Evaluation Environment
 - Benchmarks
 - Solvers
- 2 Results
- 3 More information

What's new this year

Less categories Categories Weighted and Weighted Partial have been merged

More solvers 46 solvers (14 new)

Complete solvers: 33 submissions

Incomplete solvers: 13 submissions

More benchmarks 2810 instances (711 new)

Evaluation Environment

Cluster specification

Name	UdL – AM
Operating System	Rocks Cluster 6.1, Linux 2.6.32
Processor	Intel Xeon E5–2620, 2 GHz
Memory	3.5 GB
Compilers	GCC 4.4.6, javac 1.7.0

Evaluation Environment

Resources:

- 3.5 GB of memory
- Timeout of
 - Complete 1800 seconds
 - Incomplete 300 seconds

Ranking:

- 1 Number of solved instances
- 2 Time needed to solve those instances

Categories

- Max-SAT (610 instances)
 - All soft clauses
 - Unary weights
- Partial Max-SAT (1199 instances)
 - Hard and soft clauses
 - Unary weights
- Weighted Partial Max-SAT (1001 instances)
 - Hard and soft clauses
 - Integer positive weights

New benchmarks

Reversi 6x6 Reversi “cooperative” endgame solving

Unicost Set Covering instances

ATCoss Air Traffic Controller Shift Scheduling

HSTT Real world high school timetabling problems

TPR Provably optimal circuit test cube generation

MBD Model-based circuit design diagnosis problem

New solvers

Complete

New complete solvers in the top-three:

CCLS2akms Local search solver CCLS + complete solver
ahmaxsat

Eva500a Core-guided algorithms with MaxSAT Resolution

MSCG Core-guided algorithms

OpenWBO Modular open source solver with incremental
algorithms

New solvers

Incomplete

New incomplete solvers in the top-three:

- Swcca Adaptation of the Swcca algorithm
- CCMPA Based on CCLS and CCASat solvers
- Dist Tailoring local search for Partial MaxSAT

Papers with new MaxSAT algorithms

2014

Dist Tailoring Local Search for Partial MaxSAT [Cai et al. AAAI'14]

ISAC+ MaxSAT by Improved Instance-Specific Algorithm Configuration
[Ansótegui et al. AAAI'14]

Eva500a Maximum Satisfiability Using Core-Guided MaxSAT Resolution
[Narodytska&Bacchus AAAI'14]

MSCG Progression in Maximum Satisfiability [Ignatiev et al. ECAI'14]
Core-Guided MaxSAT with Soft Cardinality Constraints
[Morgado et al. CP'14]

Open-WBO Open-WBO: a Modular MaxSAT Solver [Martins et al. SAT'14]
Incremental Cardinality Constraints for MaxSAT [Martins et al. CP'14]

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Interesting Facts

- 22 submitters
- 46 solvers. Two types:
 - Complete solvers: 33
 - Incomplete solvers: 13
- 5009 benchmark instances
- Computation time: 2 months
- Ranking:
 - 1 Number of solved instances
 - 2 Time to solve those instances

Complete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random				
Crafted				
Industrial				

Complete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	ahmaxsat-ls	ahmaxsat	CCLS2akms
	2nd	ahmaxsat	ahmaxsat-ls	ahmaxsat-ls
	3rd	CCLS2akms	ISAC+	ISAC+
Crafted				
Industrial				

Complete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	ahmaxsat-ls	ahmaxsat	CCLS2akms
	2nd	ahmaxsat	ahmaxsat-ls	ahmaxsat-ls
	3rd	CCLS2akms	ISAC+	ISAC+
Crafted	1st	ahmaxsat-ls	ISAC+	ISAC+
	2nd	ahmaxsat	SCIP	ILP
	3rd	ISAC+	ILP	MaxHS
Industrial				

Complete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	ahmaxsat-ls	ahmaxsat	CCLS2akms
	2nd	ahmaxsat	ahmaxsat-ls	ahmaxsat-ls
	3rd	CCLS2akms	ISAC+	ISAC+
Crafted	1st	ahmaxsat-ls	ISAC+	ISAC+
	2nd	ahmaxsat	SCIP	ILP
	3rd	ISAC+	ILP	MaxHS
Industrial	1st	Open-WBO-Inc	ISAC+	Eva500a
	2nd	CLASP	OpenWBO-Inc	ISAC+
	3rd	Eva500a	Eva500a	MSCG

Incomplete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random				
Crafted				
Industrial				

Incomplete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	CCAT	Dist	Dist
	2nd	CCLS	CCLS	CCLS
	3rd	Swcca_ms	CCMPA	CCMPA
Crafted				
Industrial				

Incomplete Solvers

Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	CCAT	Dist	Dist
	2nd	CCLS	CCLS	CCLS
	3rd	Swcca_ms	CCMPA	CCMPA
Crafted	1st	CCLS	Dist	Dist
	2nd	CCMPA	WPM-2014-in	WPM-2014-in
	3rd	Swcca_ms	CCLS	CCLS
Industrial				

Incomplete Solvers

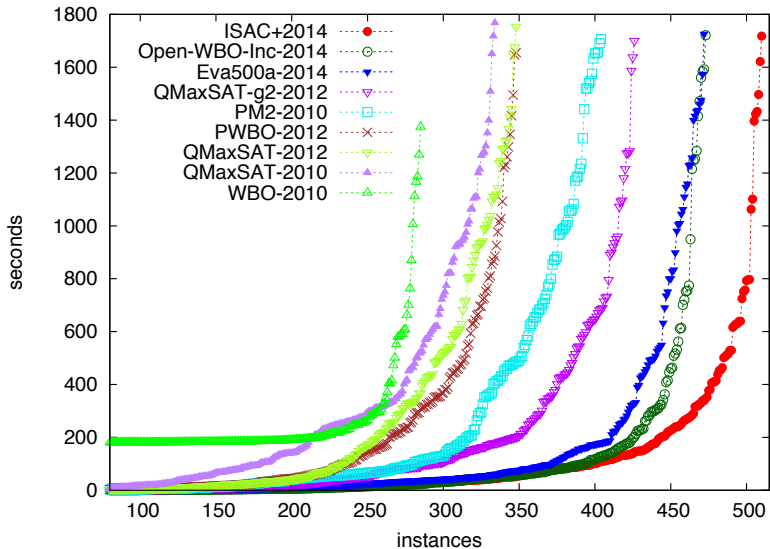
Solver Type:

local Search branch&bound reformul. core-guided portfolio

		MaxSAT	Partial	W. Partial
Random	1st	CCAT	Dist	Dist
	2nd	CCLS	CCLS	CCLS
	3rd	Swcca_ms	CCMPA	CCMPA
Crafted	1st	CCLS	Dist	Dist
	2nd	CCMPA	WPM-2014-in	WPM-2014-in
	3rd	Swcca_ms	CCLS	CCLS
Industrial	1st	optimax2-r-i	WPM-2014-in	WPM-2014-in
	2nd	WPM-2014-in	optimax2-rn-i	optimax2-g-i
	3rd	optimax2-rn-i	optimax2-r-i	optimax2w-r-i

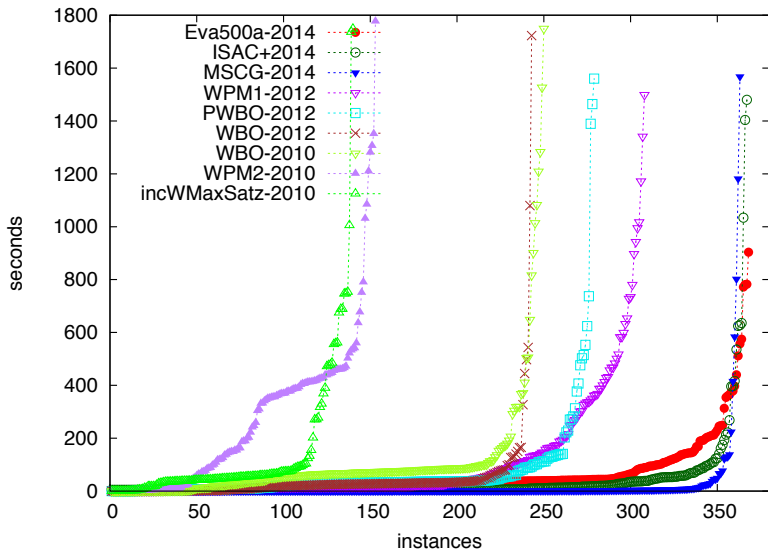
Evolution of MaxSAT solvers

Partial Industrial 2010-2014



Evolution of MaxSAT solvers

Weighted Partial Industrial 2010-2014



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- Max-SAT Evaluation 2014 web page
 - <http://maxsat.ia.udl.cat/>
- Tables with mean times and number of solved instances
- Tables with percentages of solved instances for each set
- Complete ranking tables
- All the cactus plots
- Detailed results for each set of instances
- Description of the solvers and benchmarks.

Thanks

Thanks to the people that contributed solvers and benchmarks, and to the **Universitat de Lleida** for allowing us to use their clusters.

We encourage you to participate in the next

Max-SAT Evaluation!

